REMARKS

This Amendment is submitted in response to the final Office Action mailed on February 22, 2010. A Request for Continued Examination ("RCE") ($810.00) is submitted herewith. The Director is authorized to charge $810.00 for the RCE and any additional fees which may be required, or to credit any overpayment to Deposit Account No. 02-1818. If such a withdrawal is made, please indicate the Attorney Docket No. 3712174-00453 on the account statement.

Claims 1-4, 6-12 and 14-21 are pending in this application. Claims 5 and 13 were previously canceled without prejudice or disclaimer, and Claims 1 and 9 were previously withdrawn from consideration. In the Office Action, Claims 2-4, 6-8, 10-12 and 14-19 are rejected under 35 U.S.C. §112. Claims 2-4, 6-8, 10-12 and 14-21 are further rejected under 35 U.S.C. §103. In response, Claims 2, 10 and 20-21 have been amended. The amendments do not add new matter. At least in view of the amendments and/or for the reasons set forth below, Applicants respectfully submit that the rejections should be withdrawn.

Applicants respectfully note that Claims 20-21 have been amended solely for clarification purposes. The amendments do not add new matter. The amendments are supported in the Specification at, for example, page 7, paragraphs 65-66; Table 3.

In the Office Action, Claims 2-4, 6-8, 10-12 and 14-19 are rejected under 35 U.S.C. §112, first paragraph, for failure to comply with the written description requirement. The Patent Office asserts that the Specification fails to provide support for the limitation of "a particle projecting from a substrate." See, Office Action, page 2, lines 16-19. In response, Applicants have amended Claims 2 and 10 to remove the phrase "composed of a particle" and instead recite "a projection formed on a substrate." These amendments do not add new matter. The amendments are fully supported in the Specification at, for example, pages 1-2, paragraph 13; page 2, paragraphs 20-22; page 3, paragraph 26; page 5, paragraph 57; page 6, paragraph 63; Table 6; page 7, paragraph 65; Tables 2-3; pages 7-8, paragraph 67; page 8, paragraph 69; Table 4; Figs. 1-2.

Accordingly, Applicants respectfully request that the rejection of Claims 2-4, 6-8, 10-12 and 14-19 under 35 U.S.C. §112, first paragraph, be withdrawn.

In the Office Action, Claims 2-4, 6-8, 10-12 and 14-21 are rejected under 35 U.S.C. §103(a) as being unpatentable over Japanese Patent Publication No. 11-135115 A to Akagi et al. ("*Akagi*") in view of U.S. Patent Publication No. 2004/0224231 A1 to Fujimoto et al.

("*Fujimoto*") as evidenced by U.S. Patent Publication No. 2007/0275301 A1 to Asahina et al. ("*Asahina*"). In response, Applicants have amended independent Claims 2 and 10. In view of the amendments and/or for at least the reasons set forth below, Applicants respectfully submit that, even if combinable, the cited references fail to disclose or suggest each and every element of independent Claims 2 and 10 and Claims 3-4, 6-8, 11-12 and 14-21 that depend therefrom.

Independent Claims 2 and 10 recite, in part, an anode including an anode current collector having a projection formed on a substrate; and an anode active material layer being formed on and covering the anode current collector and projection through at least one method selected from the group consisting of a vapor deposition method, a liquid-phase deposition method and a sintering method, and including at least one material selected from the group consisting of silicon (Si) and silicon compounds, wherein an average diameter of the projection ranges from about 3 μm to about 10 μm. These amendments do not add new matter. The amendments are supported in the Specification at, for example, pages 1-2, paragraph 13; page 2, paragraphs 20-22; page 3, paragraph 26; page 5, paragraph 57; page 6, paragraph 63; Table 6; page 7, paragraph 65; Tables 2-3; pages 7-8, paragraph 67; page 8, paragraph 69; Table 4; Figs. 1-2. By forming the projection having the claimed diameter on a substrate, sufficient anchoring between the anode current collector and the anode active material layer can be obtained, thereby preventing the anode active material layer from falling off, peeling off or being cracked during expansion and shrinkage upon charge and discharge, as well as preventing decomposition of the electrolyte. See, Specification, pages 1-2, paragraph 13; page 2, paragraph 22; page 4, paragraph 38; page 5, paragraph 54; page 6, Table 1; page 7, Tables 2-3. In contrast, even if combinable, the cited references fail to disclose every element of the present claims.

For example, even if combinable, *Akagi* and *Fujimoto* fail to disclose or suggest an anode current collector having a projection formed on a substrate, wherein an average diameter of the projection ranges from about 3 μm to about 10 μm as required, in part, by independent Claims 2 and 10. The Patent Office admits that *Akagi* fails to teach an anode current collector having projections and instead relies on *Fujimoto* for the claimed element. See, Office Action, page 3, lines 17-22; page 4, lines 1-11. Specifically, the Patent Office asserts that Fujimoto teaches projections having an average diameter ("particle size") of 1.89 μm and that the prior art range is close enough to the claimed range that one skilled in the art would have expected them to have similar properties. See, Office Action, page 3, lines 21-22; page 4, lines 1-6.

However, the portions of *Fujimoto* relied on by the Patent Office merely disclose a substrate having particles deposited thereon with an average height of 0.39 μm. See, *Fujimoto*, page 4, paragraphs 51-53; Table 1. For example, *Fujimoto* teaches that copper particles are deposited on a substrate "a" having an average height of roughness Ra of 0.72 μm and a maximum height Ry of 4.10 μm. See, *Fujimoto*, page 4, paragraphs 50 and 52; Table 1; *Asahina*, page 1, paragraph 7 (Ra represents average roughness); pages 2-3, paragraph 22 (Ry represents the maximum height). After the copper particles are deposited on the substrate, the average roughness Ra was 1.11 μm and the maximum height Ry was 5.99 μm. See, *Fujimoto*, page 4, paragraph 50; Table 2. Therefore, the average height Ra of the particles is only 0.39 μm (=1.11 μm – 0.72 μm). The Patent Office asserts that "the copper particle size" of *Fujimoto* is 1.89 μm. See, Office Action, page 4, lines 2-3. However, the 1.89 μm value obtained by the Patent Office is the maximum height Ry of the projections (=5.99 μm – 4.10 μm), not the average height Ra. Moreover, Applicants respectfully note that the roughness values Ra and Ry merely represent height values for the particles. Nowhere does *Fujimoto* teach or suggest the diameter of its copper particles. As such, *Fujimoto* fails to disclose an anode current collector having projections with a specific diameter or with a diameter in the claimed range. Thus, even if combinable, the cited references fail to disclose an anode current collector having a projection formed on a substrate, wherein an average diameter of the projection ranges from about 3 μm to about 10 μm in accordance with the present claims.

Moreover, one of ordinary skill in the art would have no reason to optimize the average diameter of the copper particles of *Fujimoto* to arrive at the present claims because *Fujimoto* fails to teach that the average diameter of its copper particles has any particular effect on the adhesion of the anode active material layer or the performance of the battery. "A particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation." See, M.P.E.P. § 2144.05(B) (2009). *Fujimoto* is entirely directed to a current collector which has irregularities on its surface and a thin film anode active material layer that has spaces extending in a thickness direction and configured to increase their width toward valleys of the irregularities. See, *Fujimoto*, Abstract; page 1, paragraphs 10-11. *Fujimoto* teaches that the spaces in its thin film, which are wider near the current collector surface, absorb the change in volume of the anode active material during

expansion and shrinkage. See, *Fujimoto*, page 1, paragraph 12. However, nowhere does *Fujimoto* disclose the average diameter of its copper particles, nor that the average diameter achieves any particular result. Instead, *Fujimoto* is directed to improving the cycle characteristics of its battery using spaces in the anode active material layer to relax the stress that results from expansion and shrinkage during charge and discharge. See, *Fujimoto*, Abstract; page 1, paragraphs 12-13. Thus, Applicants respectfully submit that one skilled in the art would have no reason to modify or optimize the average diameter of the copper particles of *Fujimoto* in order to obtain an anode current collector having a projection formed on a substrate, wherein an average diameter of the projection ranges from about 3 μm to about 10 μm in accordance with the present claims.

Accordingly, Applicants respectfully request that the rejection of Claims 2-4, 6-8, 10-12 and 14-21 under 35 U.S.C. §103(a) to *Akagi*, *Fujimoto* and *Asahina* be withdrawn.

For the foregoing reasons, Applicants respectfully submit that the present application is in condition for allowance and earnestly solicit reconsideration of same.

Respectfully submitted,

K & L GATES LLP

BY _____

Thomas C. Basso
Reg. No. 46,541
Customer No. 29175

Date: May 24, 2010